

DATE: February 28, 1977

To : *John Markit*

FROM : Joshua Lederberg

SUBJECT: Soviet Interpretations<sup>\*</sup> of Recombinant DNA ("U.S. Military 'R&D' through Soviet Eyes" by Michael Milstein and Lev Semejko, Bull. Atomic Scientists 33:32-38, 1977).

I had not understood the fuss about "recombinant DNA" at the CCD, and had taken for granted the substance of editor's note, (p.36) - until I had the opportunity to read this article.

But in fact, there is a loophole in the 1972 BW convention! Article I refers to "Microbial or other biological agents, or toxins...."

A synthetic DNA might validly be claimed to be neither a "biological agent" nor a toxin. Yet one could imagine the development of a synthetic DNA - modelled upon but not identical to a virus - which could be used for hostile purposes.

A similar loophole applies to new synthetic polypeptide sequences that might mimic natural toxins.

The problem arose, in part, from the introduction of the "toxins" question after the main problems in drafting the treaty had been overtaken - and no one was willing to risk reopening the text for "technicalities".

"Recombinant DNA" has little to do with this story. But synthetic DNA - a la Khorana - is right on the mark. And it is not covered by disclaimers at the last session of CCD.

[ If there is any possibility of any CW treaty, that may be the best place to plug these loopholes. If not, a formal assertion that the U.S. regards any use for hostile purposes of nucleic acids (whether biological, semi-synthetic, or synthetic) to be forbidden within the spirit of the BW convention, and asking other powers to do the same, would be a positive step (1) in answer to the Milstein-Semejko perspective, and (2) to quiet a certain amount of domestic paranoia. ]

*J. Lederberg*

*\* and of the Brezhnev proposal on weapons of mass destruction.*